wardly. The cage 308 is driven in a clockwise directi n viewing FIG. 17, corresponding to the direction f rotation of the cutters 32a and 32b.

The cage 308 is constructed in an identical manner to the cages 46 and 100 and therefore will not be explained in detail. Unlike the cages 46 and 100, however, the cage 308 is suspended in place with an absence of drive structure or cutter structure beneath the bottom thereof and the top of the gear case 34. An upright drive shaft 310 extends upwardly through the center of the cage 308, through the top wall 54, and into a flat horizontal gear case 312. Within the gear case 312, a gear train is contained for transferring power between the shaft 80 of cutter 32b, the shaft 310 of the cage 308 and the shaft 50 of the cutter 32a. Such gear train includes a spur gear 314 on the shaft 80, a spur gear 316 on the shaft 310, a spur gear 318 on the shaft 50, an idler gear 320 rotatably supported in meshing engagement with the spur gears 314 and 316, and a second idler gear 322 in meshing engagement with the spur gears 316 and 318. It will be seen that the gear case 312 can be as long as necessary to accommodate the length of gear train that is appropriate for the number of cutters and conveyor cages utilized outboard of the discharge opening 102. Thus, although the present invention has been illustrated with only two outboard cutters 32a and 32b, it will be appreciated that a greater number of outboard cutters may be utilized. A similar gear train and case could be used as one form of overhead power transmitting mechanism in lieu of the mechanisms 83 and 134, 136 and 148, 150 and 158, and 186, 206.

The power for driving the cutter bed 30 in the embodiment of FIGS. 16–18 is hydraulic power, one of the hydraulic motors 66 being illustrated as drivingly coupled with the shaft 80 of the cutter 32b. Mechanical power could be used instead.

Furthermore, although the embodiments of FIGS. 16–18 illustrate a single, relatively large diameter rotary member between the cages of the two outermost cutters, it will be appreciated that the single member could be replaced by two or more smaller diameter rotary members without departing from the principles of the present invention. If the smaller diameter members are utilized, it would be important to shift their axes of rotation far enough forwardly to assure that their forward extremities are generally transversely aligned with the front extremities of the cages 46 and 100, for example, so as to effectively provide a moving conveying surface.

Although preferred forms of the invention have been described above, it is to be recognized that such disclosure is by way of illustration only, and should not be utilized in a limiting sense in interpreting the scope of the present invention. Obvious modifications to the exemplary embodiments, as hereinabove set forth, could be readily made by those skilled in the art without departing from the spirit of the present invention.

The inventors hereby state their intent to rely on the Doctrine of Equivalents to determine and assess the reasonably fair scope of their invention as pertains to any apparatus not materially departing from but outside the literal scope of the invention as set out in the following claims.

We claim:

1. In a machine for mowing crop materials, the improvement comprising:

a cutter bed including a series of rotary cutters extending across the path of travel of the machine and r tatable about individual upright axes;

a crop discharge opening located behind the cutter bed for receiving severed crop materials from the series of cutters,

said discharge opening having a pair of opposite ends,

said series of cutters including a group of intermediate cutters positioned in front of said discharge opening with the first and last cutters of said intermediate group being located adjacent said opposite ends of the discharge opening,

said series of cutters further including at least a pair of opposite end cutters located outboard of the first and last cutters of the intermediate group and outboard of said discharge opening;

means for driving the cutters of said intermediate group in oppositely rotating pairs for directing severed material between the cutters of each pair and into the discharge opening,

the first and last cutters of the intermediate group rotating generally inwardly toward the discharge opening across the front of the cutter bed;

means for driving the end cutters in the same direction as their next adjacent first or last cutter of the intermediate group such that the end cutters and the first and last cutters of the intermediate group all rotate generally inwardly toward the discharge opening across the front of the cutter bed; and

conveying means operably associated with each end cutter and its next adjacent intermediate group cutter for moving cut crop materials inwardly toward said discharge opening.

2. In a machine for mowing crop materials as claimed in claim 1,

said conveying means including an endless conveyor belt entrained around the axes of rotation of the end cutter and its next adjacent intermediate group cutter,

said conveyor belt having a generally upright, flat, front surface and being driven in a direction to move said front surface toward the discharge opening.

3. In a machine for mowing crop materials as claimed in claim 1,

said conveying means including an upright generally cylindrical impeller projecting upwardly from each end cutter and its next adjacent intermediate group cutter,

said conveying means further including an intermediate, upright, generally cylindrical impeller located between each end cutter and its next adjacent intermediate group cutter,

said intermediate impeller being rotatable in the same direction as the corresponding end cutter and adjacent intermediate group cutter such that the impellets effectively present a forwardly facing, inwardly moving front surface for conveying cut crop materials toward the discharge opening.

4. In a machine for mowing crop materials as claimed in claim 3,

said intermediate impeller comprising a drum having an at least substantially solid exterior wall.

5. In a machine for mowing crop materials as claimed in claim 3,

said intermediate impeller comprising a cage having a series of upright members arranged in a circumferentially spaced pattern.

6. In a machine f r m wing crop materials as claimed in claim 5,

said cage being suspended above and in spaced relation to the cutter bed,

said cage having a drive shaft theref r extending downwardly int the cage from above the cage.

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